Magneton-Based Wireless Data Transmission Enabling Jamming-Resistant Low-Profile Communications via Curved Transmission Pathways for Over-the-Horizon Data Links Not Reliant Upon Orbital Platforms

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Simon Edwards
Research Acceleration Initiative

Introduction

There has been a great deal of interest in communications solutions which overcome some key shortcomings, including: Susceptibility to jamming, reliance upon orbital platforms for relay, interceptibility i.e. the risk the secrecy of a message being compromised and triangulability i.e. the risk that the mere detection of a signal, regardless of an adversary's ability to decipher content, will betray information concerning the location of important assets.

Abstract

A comprehensive solution to all of these extant shortcomings lies in the induction of electrical current; an old technique originally intended to facilitate wireless power transmission. Novel materials make it possible for electrical power to be induced over greater ranges and in a directionally-specific manner. Omnidirectional power transmission is an inefficient proposition. However, through the wireless transmission of electricity, which ultimately relies upon the emission of magnetons (which follow curved pathways, profoundly) information may be transmitted in addition to the transmission of raw electrical potential.

If it were possible to create narrow projections of induction fields using metamaterials, information could be transmitted to specific destinations without excessive demand for power. As magnetons can penetrate EM-blocking metamaterials, a receiver and transmitter could each be shielded in such as way so as to ensure that a signal could not be jammed but that, simultaneously, the existence of a transmission could not be detected and that it could not be triangulated.

In an ordinary magnetic field, magnetism follows a naturally curved pathway projected from the North pole of the magnet and with some of this energy eventually finding its way back to the South pole. This stands in contrast to the dynamics of electromagnetism, which tends to move in a straight line.

If we were to pass current through an electromagnet and we were to shield that electromagnet with a novel metamaterial such as the magnetic copper-based garnet tested by Tohoku University or a similar such material, that current could be made to undergo what was termed in 2022 by this author, "pseudo-superconduction." In this effect, electrons flow through a material non-fermionically and, as they tend toward being reduced by the Hall Effect, are, rather than being converted into magnetism, made to be redirected back toward

the center of the conductive wire, preserving the current. Whereas Alternating Current could be described as a method for preventing the spillage of electricity, this approach could be described as a method for recapturing that which is inevitably spilled so as to ensure that none is wasted.

Although my initial intention was to increase the efficiency of power transmission without needing to meet the more rigid requirements for room-temperature superconduction; which would likely imply unacceptable costs for an application such as power transmission; in this case, however, the intention is to transmit smaller quantities of electricity in a specific direction so as to convey information securely and uninterruptibly.

There are two primary classes of metamaterials currently under investigation for use in advanced radio communication. One, which blocks electromagnetism but permits magnetism and the other, which blocks magnetism but permits electromagnetism. For this application, a transmitter which is designed to convey information in this manner would make use of both types of shielding whereas the receiver would only need to employ EM-blocking materials to prevent jamming. A material such as the Tohoku copper garnet would be used to redirect and recycle both flowing electrons and magnetism (this type of material works by not only redirecting electrons but by reconstituting electrons through the reflection and focusing of magnetons) while Transition Metal Dichalcogenides would be used for the EM-shielding.

A sheath around a recycling electromagnetic coil composed of the Tohoku-type copper garnet would feature an vertical actuating slit which creates a gap in the Hall Effect mitigation function, permitting current to be translated in a planar fashion into magnetism in a direction determined by the position of the slit. This layer would allow for magnetism to be projected along a two-dimensional plane rather than omnidirectionally. A second, overlapping actuating garnet sheath would feature a horizontal slit. The point at which the slits overlap would determine the precise direction in which magnetism would be projected. As any magnetism striking either of the garnet layers would be endlessly and efficiently recycled, no power would be wasted in attempting to project magnetism in directions of no consequence.

As these magnetons would follow curved pathways, this type of transmission system enables ground stations to directly communicate with other ground stations, even when over the horizon. The rate of curvature would need to be determined in testing in order to know in which precise direction an aperture must face in order to ensure that the curving particles reach the intended receiver. The power level could be varied in order to determine the rate of curvature. Transmissions of greater power would tend to have lesser rates of curvature. This is very much like calculating the direction in which to fire artillery with the added dimension of the ability to adjust the power with which the shell is projected.

Highly efficient inductive materials such as those described by this author in 17 February 2024 would be ideal and perhaps necessary for this approach.

Conclusion

As only an entity which knows to look for this mode of communication and which has access to the highly efficient inductive materials would be able to exploit the use of such a method, it should be possible to communicate on a clandestine basis using such a protocol for so long as exclusive knowledge may be maintained. Even in a scenario where an adversary is aware of this protocol, variation of the position of transmitter and receiver should prevent interception. Importantly, any attempt at interception would alter the strength of the received signal, meaning that this approach offers a means of detection of attempts at interception. A transmission may be suspended in the event that interception attempts are suspected and units may be repositioned in order to continue the secure information exchange.

This approach would be ideal for ground-to-ground and any other type of communications in which both the content and existence of a transmission ought to be covert.